Indiana's Revised Water Quality Monitoring Strategy 2011-2019

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Why Does OWQ Need a Water Quality Monitoring Strategy?

- The federal CWA requires it
- Water quality data drives effective water resource management
- Monitoring is resource intensive and there are competing interests

Previous Strategies

- First strategy in 1995
- Three revisions with no significant changes in monitoring approaches
  - Relied heavily on probabilistic monitoring to meet the CWA 305(b) requirement to “assess all waters”
  - Included some targeted monitoring approaches but few resources were allocated to them

OWQ's Revised Strategy for 2011-2019

- Comprehensive in scope; considers all of Indiana's water resources
  - Rivers and Streams
  - Lakes and Reservoirs
  - Ground Water
  - Wetlands
  - Lake Michigan Coastal Waters

Monitoring Objectives

- Identification and prioritization was critical to determine where to focus limited resources
  - Primary monitoring objectives = The protection of human health and U.S. EPA requirements
  - Secondary monitoring objectives = Everything else
- This strategy attempts to meet all primary objectives and to meet secondary objectives where possible
- Assumes current funding levels will remain static

Key Changes in the Strategy

- Probabilistic: From a five-year rotating basin approach to a nine year approach
  - One basin each year instead of two
  - Dissolved vs. Total Metals
- Fixed Stations: Reduced monitoring frequency
  - Monitoring quarterly instead of monthly at most sites
  - Monthly monitoring continued at certain stations identified by NPDES program

Three General Approaches to Water Quality Monitoring

- Probabilistic = A stratified random approach to site selection
- Targeted = Intentional selection of sampling sites based on specific monitoring objectives
- Fixed = A targeted approach to sampling in which sites do not change from season to season

Probabilistic Monitoring

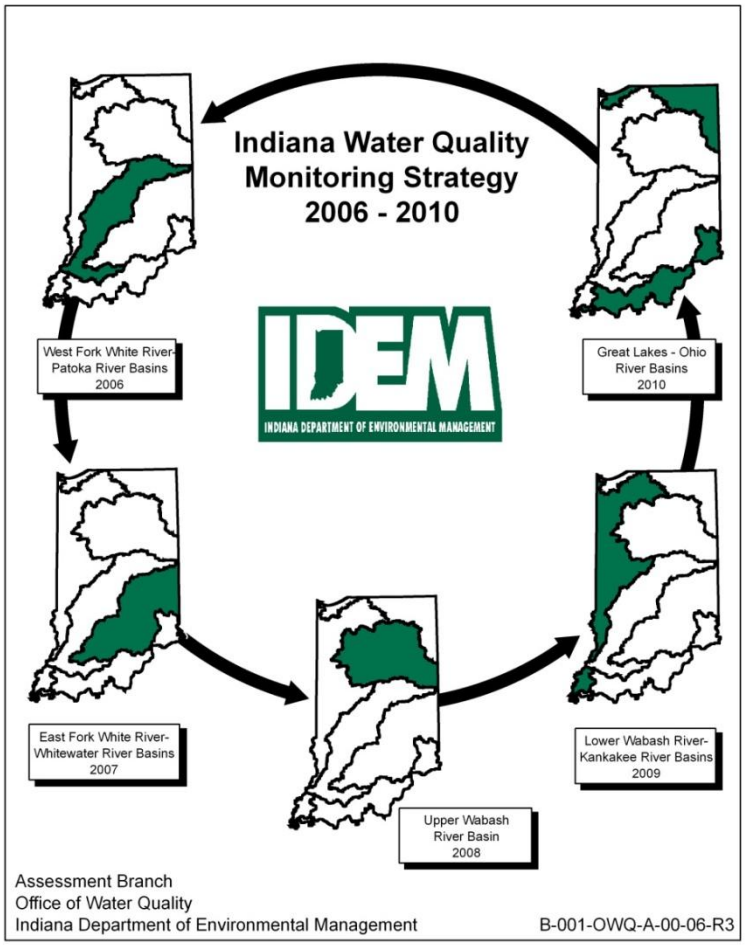
- The *only* monitoring approach that allows us to meet the CWA Section 305(b) goal of assessing "all waters of the state"
- Overall trends in water quality within each basin and allows basin-to-basin comparison
- Statistically robust w/known level of confidence
  - Can predict water quality conditions for the basin
  - Does not indicate location of specific impairments or the reasons
  - Data can also be used to make reach-specific assessments

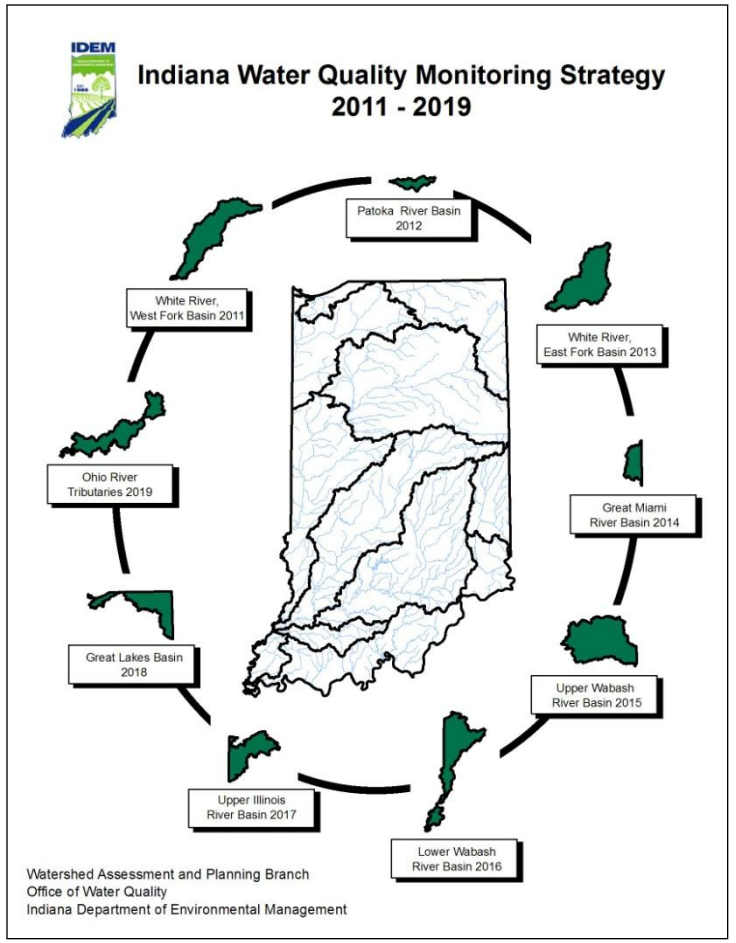
The 303(d) "Listing Machine"

Indiana's 303(d) list has grown, in part, as a function of an imbalanced approach to monitoring

- Probabilistic monitoring → Sampling conducted at new sites every season resulting in newly identified impairments that must be added to the list
- Targeted Monitoring → Needed in order to tell the other side of the story, to identify improvements that may be occurring

Five-year Rotation Compared to a Nine-year Rotation





Key Changes in the Strategy

- Probabilistic monitoring in one basin each year instead of two
  - Allows reallocation of ~50% of existing resources previously required for probabilistic monitoring
- Monitoring quarterly instead of monthly at most fixed stations
  - Allows reallocation of ~75% of existing resources previously required for monitoring at fixed stations

Benefits from Increased Targeted Monitoring

- Ability to more accurately characterize water quality impairments
- Ability to focus more resources on showing improvements in watersheds
- Allows more resources for TMDL development

OWQ's Targeted Monitoring Efforts

- Baseline monitoring to support watershed planning
- Monitoring to identify improvements in water quality
- Monitoring to support public health advisories
- Monitoring to support Total Maximum Daily Loads (TMDLs) for impaired waters
- Monitoring to support National Pollutant Discharge Elimination System permits
- Special Studies

Baseline Monitoring to Support Watershed Planning

- A value-added approach to monitoring
  - Provides important and *more comprehensive* information to support local level planning
  - Provides OWQ good baseline data for performance measures post implementation of best management practices
- May consist of one/more 10-digit watersheds depending on scale of planning effort

Baseline Monitoring to Support Watershed Planning

- Sampling density sufficient to characterize WQ conditions throughout study area
- Parameters will vary based on watershed group's data needs and water quality concerns
- OWQ will coordinate with watershed groups

Monitoring to Identify Improvements in Water Quality

- U.S. EPA requirement of performance measures for states receiving federal Clean Water Act funds
- Specific requirements vary but all depend on identifying changes in water quality
- Requires targeted, follow-up monitoring of waters previously identified as impaired
  - Emphasis on watersheds where restoration efforts are known to have occurred

Monitoring to Identify Improvements in Water Quality

- Sampling effort very focused, smaller in scope
  - One to four projects each year at the 12-digit watershed scale
  - Approximately 20 sites in each watershed
  - Parameters will vary based on the original impairment(s)

Monitoring for Development of Public Health Advisories

- Fish tissue contaminant monitoring
  - No significant changes in this strategy
- Blue-green algae and algal toxins
  - A growing public health concern
  - Pilot project in 2010 - 2011 to build internal capacity to conduct sampling and analysis
  - Develop an advisory process to notify the public of potential risks from elevated concentrations of blue-green algae and/or microcystin toxin

Lakes Monitoring

- OWQ's approach to monitoring lakes going forward remains a question
  - These decisions are dependent on the rulemaking process for lakes nutrient criteria, currently underway
  - Methods for implementing nutrient criteria for lakes are yet to be determined but will likely require changes in OWQ's approach to lakes monitoring
  - Status quo for now...

Going Forward

- The 2011-2019 WQMS supports adaptive management and continued planning
- 2011 considered a “test drive” particularly for the new targeted monitoring approaches
- Monitoring program evaluation will be conducted annually with a full review of the strategy every three years

Summary

- No significant changes to OWQ's strategy in 10+ years, yet targeted monitoring needs have increased significantly over same time period
- The new strategy lends a more balanced approach to monitoring and attempts to answer the question, "Are our waters getting any better?"
- Allows OWQ to meet more of its primary monitoring objectives than previous strategies with the same resources

Questions?

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